



**UNITED STATES DEPARTMENT OF COMMERCE
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MF

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/421,437	10/19/99	CHAPMAN	D 50265-018

LMC1/0816
HICKMAN, PALERMO, TRUONG & BECKER, LLP
1600 WILLOW STREET
SAN JOSE CA 95125-5106

EXAMINER

THOMPSON, A

ART UNIT	PAPER NUMBER
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2768

DATE MAILED: 08/16/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/421,437

Applicant(s)
David C. CHAPMAN

Examiner
A.M. Thompson

Group Art Unit
2768



☒ Responsive to communication(s) filed on Oct 19, 1999

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-33 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-33 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Oct 19, 1999 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

This application, serial number 09/421,437, has been examined. Claims 1-33 are pending.

Drawings

1. Figures 1A, 1B, 2, and 3A, 3B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect(s) can be deferred until the application is allowed by the examiner.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Pursuant to Claim 10, in the determining step, it is unclear what is being determined. For examination purposes, examiner asserts that *the routing path between the first and second integrated circuit devices is being determined.*

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Rejection of Claims 1-5, 10, 15, 22-33

6. **Claims 1-5, 10, 15, 22, 23, and 24-33** are rejected under 35 U.S.C. 102(b) as being anticipated by the Michael H. Arnold et al. paper ("the Arnold paper") entitled An Interactive Maze Router with Hints. Pursuant to Claim 1 which is drawn towards a method for automatically routing an integrated circuit, the Arnold paper discloses all the limitations of Claim 1 in the Abstract and § 1, but even if it didn't Claim 1 features limitations that are inherently part of maze routing and routers.

Pursuant to Claims 2-5, 10, 15, 22-23 and 24-33 the Arnold paper similarly reads on these limitations by disclosing goal biased searching in §4.3, obstacle identification in §4.2, straying limit criteria §§1-3, layer changes for obstacle avoidance, §§1-4, and distance to the goal considerations, §4.2 and Figure 6. The additional limitations of Claims 24-33 that incorporate computer-readable medium and a system comprising a data storage medium are inherently part of the Arnold paper's interactive maze router tool.

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Rejection of Claim 21

7. **Claim 21** is rejected under 35 U.S.C. 102(b) as being anticipated by the Suzuki et al. paper ("the Suzuki paper") entitled A Practical Online Design Rule Checking System. Pursuant to Claim 21, Suzuki discloses an automatic, incremental and iterative design rule check system, §§2-3.2.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Rejection of Claims 6-9 and 12

9. **Claims 6-9 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over the Arnold paper as applied to Claim 1 above and further in view of the Tzeng et al. paper ("the Tzeng paper") entitled Codar: A Congestion-Directed General Area Router. The Arnold paper discloses a flexible and interactive maze router. Although a rip-up and reroute algorithm may be considered part of a maze router and a global routing algorithm, the Arnold paper does not explicitly detail its inclusion. The Tzeng paper discloses the rip up and reroute process of a global and detailed routing process. It would have been obvious to one of ordinary skill in the art at the time of applicant's

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invention to modify and integrate the teaching of the Arnold paper with the Tzeng paper for a more effective and efficient routing process.

Pursuant to Claims 6-9 and 12, the Tzeng paper discloses identifying obstacles that block the routing path, §§1-2.3, and determining rip up and reroute areas, §§2, 3.

Rejection of Claims 11, 13, 14 and 16-20

10. **Claims 11, 13, 14 and 16-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over the Arnold paper as applied to Claim 1 above and further in view of the Adler et al. paper (“the Adler paper”) entitled An Interactive Router for Analog IC Design. The Arnold paper discloses a flexible and interactive maze router. The Arnold paper does not teach corner clipping, design rule changes, or attachment or bend angles. The Adler paper teaches global and maze routing which suggests corner clipping, and includes design rule modifications and routing paths of various degree angles. It would have been obvious to one of ordinary skill in the art at the time of applicant’s invention to modify the teaching of the Arnold paper with the Adler paper for a more comprehensive and effective routing tool.

Pursuant to Claims 11, 13-14 and 16-20, the Arnold paper teaches design rules §§2.1-3.4 and attachment and bend angles in all subparts of §2.

Rejection of Claims 16-18

11. **Claims 16-18** are also rejected under 35 U.S.C. 103(a) as being unpatentable over the Arnold paper as applied to Claim 1 above and further in view of the Suzuki paper. The Arnold paper discloses an interactive maze router. It does not explicitly teach an iterative design rule checking

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system. Suzuki discloses an online design rule checking (DRC) system for routing applications. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the teaching of the Arnold paper with the Suzuki paper to achieve a high performance router.

Pursuant to Claims 16-18, the Suzuki paper discloses a DRC algorithm which includes design rule checks and modified design rule checks which exclude previously verified layout areas, §§1-3.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

▷ U.S. Patent 5,303,161, Burns et al., discloses a technology independent integrated circuit mask artwork generator.

▷ U.S. Patent 5,856,927, Greidinger et al., teaches a method for automatically routing circuits of very large scale integration.

▷ U.S. Patent 6,014,507, Fujii, discloses an integrated circuit routes designing method and apparatus.

▷ U.S. Patent 6,011,912, Yui et al., discloses an automatic routing method with net ordering for facilitated collision evasion.

▷ E. Malavasi et al. paper entitled Area Routing for Analog Layout.

▷ L. -O Donzelle et al. paper entitled A New Approach to Layout of Custom Analog Cells.

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▷ Shirota et al. paper entitled A New Rip-up and ReRoute Algorithm for Very Large Scale Arrays.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A.M. Thompson whose telephone number is (703) 305-7441. The examiner can usually be reached Monday thru Friday from 8:00 a.m. to 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Paul Lintz, can be reached on (703) 305-3832. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-9051.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900 or the Customer Service Center whose telephone number is (703)306-5631.

14. Responses to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 308-9051, (for formal communications intended for entry)

(703) 305-0040 (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

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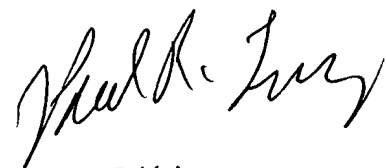
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Hand-delivered responses should be brought to Crystal Park II, 2121
Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).



AMT

AUGUST 11, 2000



Paul R. Lintz
Primary Examiner